AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A fuel cell comprising:

a membrane electrode assembly having a membrane, a first catalytic layer on a first face of said membrane and a second catalytic layer on a second face of said membrane;

a first bipolar plate assembly adjacent said first catalytic layer and in electrical contact therewith, said first bipolar plate assembly including:

a first gas distribution layer having a plurality of porous, reactant gas flow channels extending transversely through said first gas distribution layer in a generally parallel orientation, a first face of said first gas distribution layer confronting said first catalytic layer such that said plurality of porous, reactant gas flow channels are in fluid communication with said first catalytic layer; and

a first non-porous, conductive separator plate secured to a second face of said first gas distribution layer;

a second bipolar plate assembly adjacent said second catalytic layer and in electrical contact therewith, said second bipolar plate assembly including:

a second gas distribution layer having a plurality of porous, reactant gas flow channels extending transversely through said second gas distribution layer in a generally parallel orientation, a first face of said second gas distribution layer

confronting said second catalytic layer such that said plurality of porous, reactant gas flow channels are in fluid communication with said second catalytic layer; and

a second non-porous, conductive separator plate secured to a second face of said second gas distribution layer.

2. (Currently Amended) The fuel cell of claim 1 wherein each of said plurality of porous, reactant gas flow channels has a porous media having an average pore size no greater than 0.25 mm and a void fraction of no less than 85%.

3. (Currently Amended) The fuel cell of claim 1 wherein each of said plurality of porous, reactant gas flow channels comprises a transverse section of said gas distribution layer having a medial portion and a pair of lateral edge portions bordering said medial portion, said medial portion has a permeability that is at least 200% greater than a permeability of said pair of lateral edge portions.

4. (Original) The fuel cell of claim 3 wherein said medial portion has a porous media having an average pore size no greater than 0.25 mm and a void fraction of no less than 85%.

5. (Cancel)

6. (Currently Amended) The fuel cell of claim ~~5~~ 20 wherein said ~~medial~~ leg portion has a permeability that is at least 200% greater than a permeability of said ~~pair of lateral edge~~ barrier portions.

7. (Currently Amended) The fuel cell of claim ~~5~~ 20 wherein each of said ~~pair of said lateral edge~~barrier portions define a groove ~~receiving~~ having a low porosity bead disposed therein.

8. (Original) The fuel cell of claim 1 wherein said membrane electrode assembly has a convoluted configuration, and wherein said first face of said first gas distribution layer has a convoluted surface juxtaposed to said first catalytic surface and wherein said first face of said second gas distribution layer has a convoluted surface juxtaposed to said second catalytic surface.

9. (Currently Amended) The fuel cell of claim 1 wherein each of said plurality of porous, reactant gas flow channels has a gas permeability no greater than 10 kPa/cm at 5 m/s face velocity.

10. (Currently Amended) The fuel cell of claim 1 wherein each of said plurality of porous, reactant gas flow channels has a contact electrical resistivity of no greater than 50 $m\Omega\text{-}cm^2$.

11. (Original) The fuel cell of claim 10 further comprising a porous, conductive interface layer interdisposed between said at least one of said first and second gas distribution layers and at least one of said first and second catalytic layers.

12. (Original) The fuel cell of claim 11 wherein said interface layer is selected from a group consisting of an etched foil, a fine mesh screen and GPM.

13. (Original) The fuel cell of claim 1 wherein said first and second gas distribution layers are formed of a metallic foam media.

14. (Original) The fuel cell of claim 13 wherein said metallic foam media is selected from a group consisting of a high alloy stainless steel, a high alloy nickel, a titanium-based alloy, and FeCrAlY.

15. (Original) The fuel cell of claim 1 wherein said first and second gas distribution layers are formed of a graphite-based foam media.

16. (Original) The fuel cell of claim 15 wherein said graphite-based foam media is graphitized pyrolytic graphite.

17. (Original) The fuel cell of claim 1 further comprising a coolant distribution layer adjacent to said first bipolar plate assembly and in thermal contact therewith.

18. (Original) The fuel cell of claim 17 wherein said coolant distribution layer comprises a plurality of porous coolant flow channels extending transversely through said coolant distribution layer in a generally parallel orientation.

19. (Cancel)

20. (New) The fuel cell of claim 1 wherein each of said wherein each of said plurality of porous, reactant gas flow channels comprises:

a leg portion having a first width and a first porosity extending transversely through said gas distribution layer; and

a barrier portion disposed on each side of said leg portion, said barrier portions having a second width which is less than said first width and a second porosity which is substantially less than said first porosity to channelize the flow of reactant gases through each of said plurality of porous, reactant gas flow channels.

21. (New) The fuel cell of claim 18 wherein each of said wherein each of said plurality of porous coolant flow channels comprises:

a leg portion having a first width and a first porosity extending transversely through said coolant distribution layer; and

a barrier portion disposed on each side of said leg portion, said barrier portions having a second width which is less than said first width and a second porosity which is substantially less than said first porosity to channelize the flow of coolant through each of said plurality of porous coolant flow channels.